



UNITED STATES PATENT AND TRADEMARK OFFICE

ck
UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|-------------------------|------------------------|
| 10/791,853 | 03/04/2004 | Ryo Takeshita | US-163 | 5567 |
| 38108 | 7590 | 07/03/2007 | | |
| CERMAK & KENEALY LLP ACS LLC 515 EAST BRADDOCK ROAD SUITE B ALEXANDRIA, VA 22314 | | | EXAMINER MARX, IRENE | |
| | | | ART UNIT 1651 | PAPER NUMBER |
| | | | MAIL DATE 07/03/2007 | DELIVERY MODE PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/791,853

Applicant(s)

TAKESHITA ET AL.

Examiner

Irene Marx

Art Unit

1651

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 June 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 8-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 8-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/13/07 has been entered.

Claims 1 and 8-10 are being considered on the merits.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 8 is confusing in the recitation of "said alkane comprises an alkane", respectively "said alcohol comprises an alcohol". It is unclear what is intended. Amendment to replace "comprises" by "is" would be remedial. However, if a mixture of alkanes is intended, the claims should be amended accordingly. No new matter may be introduced.

In addition, claim 8 is confusing in the recitation "between 1 to 8 carbon atoms". Correction to either "between 1 and 8" or "from 1 to 8" would be remedial. See also claim 1, line 2.

Claim Rejections - 35 USC § 103

Claims 1 and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lloyd *et al.* taken with Stainthorpe *et al.* and West *et al.*

Lloyd *et al.*, disclose the bioconversion of methane to methanol with a processed product obtained from *M. trichosporium* (See, e.g., page 461, paragraph 1) and also disclose that the genes encoding for soluble methane mono-oxygenase have been cloned and sequenced. See, e.g., page 462, paragraph 4. In addition, the reference teaches a method of culturing mutant strains of *M. trichosporium* which have lost the ability to inherently use an alkane (page 466,

Art Unit: 1651

paragraph 1) and which have been transformed with soluble methane monooxygenase genes such that the recombinant microorganisms become capable of using an alkane such as methane (page 465, last paragraph). That the transformed microorganisms make at least some methanol can be presumed from the disclosure at page 461, from which it is clear that at least some of the methane used is biotransformed to produce at least some methanol.

The reference differs from the invention as claimed in that it does not disclose the production of an alcohol such as methanol wherein the microorganism expressing the soluble-type MMO is *Escherichia coli*, for example. However, West *et al.* disclose the expression of *E. coli* of methane monooxygenase genes. In addition, Stainthorpe *et al.* discusses the genetic composition of the mono-oxygenase from *Methylococcus capsulatus*.

Accordingly, one of ordinary skill in the art would have had a reasonable expectation of success in transforming *Escherichia coli* with the genes obtained from strains of a *Methylococcus capsulatus* strain and expressing the genes for the production of an alcohol from an alkane by using a processed product of the microorganism containing the enzymes of interest.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to modify the process of Lloyd *et al.* by using a transformed strain of *Escherichia coli* or a processed product thereof as taught by West *et al.* for the expected benefits of reducing the concentrations of atmospheric methane by producing methanol from methane in an economic and efficient manner.

Thus, the claimed invention as a whole was clearly *prima facie* obvious, especially in the absence of evidence to the contrary.

Response to Arguments

Applicant's arguments have been fully considered but they are not deemed to be persuasive.

Applicants argument is correct. The claims are directed to a process rather a product. However, the product used in the process requires the process of culturing *E. coli* that expresses a DNA comprising certain genes, which is seen as a product by process.

Also applicant fails to recognize that the process requires the use of the transformed strain or of a **"processed product thereof"**. This recitation reads on the use of any processed product that contains the enzymes regardless of its origin.

Art Unit: 1651

"[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted) (Claim was directed to a Novolac color developer. The process of making the developer was allowed. The difference between the inventive process and the prior art was the addition of metal oxide and carboxylic acid as separate ingredients instead of adding the more expensive pre-reacted metal carboxylate. The product-by-process claim was rejected because the end product, in both the prior art and the allowed process, ends up containing metal carboxylate. The fact that the metal carboxylate is not directly added, but is instead produced in-situ does not change the end product.).

Furthermore, the process is claimed in terms of the composition used to make it which is claimed as a product-by-process. Since the U.S. Patent and Trademark Office is not equipped to manufacture products by the myriad of processes put before it and then obtain prior art products and make comparisons therewith, a lesser burden of proof is required to make out a case of *prima facie* anticipation/obviousness for product-by-process claims because of their peculiar nature than when a product is claimed in the conventional manner. MPEP 2113. Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). "When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not." *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). Therefore, the *prima facie* case can be rebutted by evidence showing that the prior art products do not necessarily possess the characteristics of the claimed product. *In re Best*, 562 F.2d at 1255, 195 USPQ at 433.

Even though the claims now directed to the expression of particular enzymes, at least the

Art Unit: 1651

West *et al.* reference teaches the expression in *E. coli* of methane monooxygenase genes, while Stainthorpe *et al.* discusses the genetic composition of the mono-oxygenase from *Methylococcus capsulatus*.

The claims are directed to the bioconversion of an alkane to an alcohol using any transformed *E. coli* comprising the touted genes. There is no indication that all of the genes are expressed in order to carry out the process, particularly whenever a processed product is used.

The conditions of culturing *E. coli* are routine in the art and are not seen to confer patentability to the process.

Therefore the rejection is deemed proper and it is adhered to.

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Irene Marx whose telephone number is (571) 272-0919. The examiner can normally be reached on M-F (6:30-3:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael G. Wityshyn can be reached on 571-272-0926. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Irene Marx
Primary Examiner
Art Unit 1651